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is the intuitional; and the largest and best portion of his work is devoted to setting forth the intuitional theory of conscience and the moral law, with criticisms of opposing views. In so doing he reveals both the strength and the weakness of his own position. The grand defect in the utilitarian ethics has always been its failure to account for the sense of obligation; and Professor Calderwood has no difficulty in showing that all their attempts to derive this sentiment by association or evolution from the lower feelings of our nature have thus far been unsuccessful. In discussing the views of the Hegelians and Neo-Kantians, our author has the same difficulty that others have in understanding what they mean by 'self-realization,' and how this can be made the basis of moral conduct. Professor Calderwood's own theory, however, has in our eyes a defect hardly less momentous than those he points out in the others; namely, its failure to reduce the moral law to one fundamental principle. Our conscience, he says, knows intuitively that we ought to be industrious, truthful, temperate, and so forth; but each of these is given as a distinct and independent law, having no connection with the rest. He maintains, indeed, that all the various moral laws are in perfect harmony with one another; but, if this is the case, there must be some deeper principle on which that harmony depends, and this principle must be the fundamental moral law. It is obvious, however, that a purely intuitional ethics, which rejects all reference to ends, can never supply such a principle, but we must look for it in some other direction.

Western China: A Journey to the Great Buddhist Centre of Mount Omei. By Rev. VIRGIL C. HART. Boston, Ticknor. 12°. \$2.

THE author of this interesting description of western China and its temples and sceneries is so well versed in the Chinese language, and so well acquainted with Chinese customs, that his book cannot fail to be full of material of the greatest interest. During a twenty-two years' residence in China, more particularly in the central parts of the empire, he has acquired a thorough knowledge of the religion of the Chinese, and therefore his descriptions and explanations of the great religious centre in western China are full of interest to the student of Buddhism. In 1887 the author was appointed to visit western China and re-open a mission at Chung King, which had been destroyed by a mob. After re-establishing the mission, he made a visit of a month's duration to Mount Omei, which is one of the great centres of Buddhistic worship. It is the adventures of this journey and his observations on Mount Omei which the author describes in his book. The produce of the districts he visited, and the mode of life and the trades of the inhabitants, as well as the wonderful scenery of the gorges of the Yang-tse, are the subjects of the author's interesting descriptions. But the reader will be especially attracted by his observations on the wonderful works of art in this region. The author says, "Here, near the borders of Chinese civilization, we find a region of unequalled sublimity, a combination of lofty mountains, of swift rivers, of valleys of wondrous fertility. Then, also, of the works of man there are many, such as thousands of brine-wells, a great silk-culture, of which it is the centre, a white-wax industry, mountains chiselled into the forms of idols, colossal bronze statues, pagodas, and one temple wholly of rich bronze." Valuable translations of Chinese inscriptions found in these regions make the author's descriptions still more interesting, opening, as they do, a view upon the ancient history of this district, and upon the state of mind in which the pilgrim gazes at these works of religious devotion.

Elementary Classics. London and New York, Macmillan. 24°. 40 cents each.

THREE new volumes of this useful series have reached us. Rev. G. H. Nall has edited 'Stories from Aulus Gellius,' with notes, exercises, and vocabularies for the use of lower forms, and intended as a pleasant change to young boys after a course of 'Cornelius Nepos,' and 'Eutropius.' The language of the original has been simplified in part, and some rare or late words and constructions have been cut out. Rev. H. M. Stephenson has edited the fourth book of the 'Æneid' on the same plan as the ninth, which was published a short time ago. The third volume of the series are selections from Xenophon's 'Anabasis,' Book IV., edited by Rev. E. D. Stone, and accompanied by an historical introduction, notes, exer-

cises, and a vocabulary. This special portion has been selected as a record of hardihood and adventure likely to be of special interest to boys.

Talks on Psychology applied to Teaching. By A. S. WELCH. New York and Chicago, E. L. Kellogg & Co. 16°.

THE present little volume has been written from an educational point of view, its object being to give a review of psychology as applied to teaching. Many instructors in our common and graded schools are familiar with the branches they teach, but deficient in knowledge of the mental powers whose development they seek to promote. The teacher, however, must comprehend fully not only the objects studied by the pupil, but the efforts put forth in studying them, the effect of these efforts on the faculty exerted, and their result in the form of accurate knowledge. These have been the leading considerations in determining the character and scope of the book. The first part of the book is a brief summary of psychological data, while the second contains their special application to teaching-purposes.

A First Book in German. By H. C. G. BRANDT. Boston, Allyn & Bacon. 12°. \$1.

THE present volume is the first part of Brandt's 'German Grammar,' bound together with 'The Student's Manual of Exercises,' prepared and arranged by A. Lodeman to accompany the former. Thus a book is obtained that is well adapted for use in secondary schools. The first part is an unaltered reprint from the fourth edition of the grammar, which is very concise and clear. Accidence and syntax are completely separated. The syntax is treated to a certain extent from an historical standpoint. Although in the first part only brief remarks on this subject are found, they will interest the pupil. The present partial edition has been prepared at the suggestion of teachers, and will undoubtedly prove very useful.

Macmillan's Greek Course. London and New York, Macmillan. 16°.

MR. H. G. UNDERHILL has compiled a series of 'Easy Exercises in Greek Accidence,' and Mr. W. Gunion Rutherford has used the occasion to prepare a new edition of his 'First Greek Grammar,' which, in its general arrangement, remains as the former editions, although it has been thoroughly revised and partly rewritten. The first part of the grammar is a drill-book for beginners, "more accurately compiled than those generally in use," while all advanced matter is confined to a second part. The grammar, in its original form, gained many friends, and it has become still more useful in its revised form, and by the addition of the collection of exercises by Mr. Underhill, of which it is the starting-point.

NOTES AND NEWS.

THE committee on science and the arts, of the Franklin Institute of Pennsylvania, is empowered to award, or to recommend the award of, certain medals for meritorious discoveries and inventions. These medals are (1) the Elliott Cresson medal (gold), founded by the legacy of Elliott Cresson of Philadelphia; and (2) the John Scott legacy premium and medal (twenty dollars and a medal of copper), founded in 1816, by John Scott, a merchant of Edinburgh, Scotland, who bequeathed to the city of Philadelphia a considerable sum of money, the interest of which should be devoted to rewarding ingenious men and women who make useful inventions. Upon request made to the secretary of the Franklin Institute, Philadelphia, full information will be sent respecting the manner of making application for the investigation of inventions and discoveries.

— In his annual report, Surgeon-General Moore says of the health of the United States Army that the mean strength of the army for the year, including officers and both white and colored enlisted men, is stated at 23,841, of which 21,601 were whites and 2,240 were colored. The total admissions to sick report were 29,727 (white, 26,600; colored, 3,127); ratio of all admissions per 1,000 of all mean strength, 1,231.42 white, and 1,395.98 colored; deaths from all causes, 188 white, 26 colored, — total, 214; ratio of deaths per 1,000 of mean strength, 7.88 white, 10.71 colored, — total 8.12. The death-rate was somewhat lower than the rate for the previous decade, which was 11.4. The death-rate of the

army of the United States continues to be higher than that of any foreign armies, except the British and Italian. The principal causes of deaths were pneumonia and shot-wounds.

—Dr. William Osler, professor of clinical medicine in the University of Pennsylvania, has been appointed physician to the Johns Hopkins Hospital, and professor of medicine in the Johns Hopkins University. Dr. Osler took his degree in the McGill University, Montreal. He subsequently studied in London, Berlin, and Vienna, and in 1885 was appointed Gulstonian lecturer in the Royal College of Physicians, London, and in 1886 Cartwright lecturer in the College of Physicians and Surgeons, New York.

—Prof. Simon Newcomb has gained great benefit from his sojourn at Chelsea Hospital, and has now gone to Asheville, N.C., accompanied by his daughter, for the purpose of enjoying the fresh mountain air there.

—Major J. W. Powell, at the meeting of the Philosophical Society of Washington last Saturday, read a paper on 'The Laws of Corrosion,' explaining their methods of operation under various conditions; Prof. E. B. Fernow also read a very important paper on 'The Influence of Forests upon Quantity and Frequency of Rains.' The full text of the former, which is a very important discussion of a law first definitely announced by Major Powell in his letter to the New Orleans Chamber of Commerce, and a full abstract of the latter, will be published in early issues of *Science*.

—The wisdom of the policy of Surgeon-General Hamilton in establishing a camp of refuge for persons fleeing from points infected with yellow-fever is amply vindicated by the record of Camp Perry. The following despatch from Dr. Hutton, who is in charge of the camp, gives some interesting facts: "Oct. 20: To-day completes two months at Camp Perry; 810 refugees from infected points have been received; 721 have been discharged; 25 cases of fever developed; 1 death Sept. 9; not a case contracted in camp. Our 60 unacclimated employees, 5 of whom have been two months in fever-camp, not a single case of fever of any kind among them. Not a known case of fever reported from the 721 cases discharged and scattered to all parts of the country. In view of these facts, how any sanitarians can consider Camp Perry as an infected place is incomprehensible. Drs. Faget and Posey of New Orleans, Guitéras, and Geddings give this their emphatic indorsement."

—Messrs. James W. Queen & Co., Philadelphia, have just issued a new catalogue of chemical apparatus. In this they have omitted reference to old and obsolete forms, and endeavored to make a catalogue the most complete and useful ever issued in this country. The catalogue will be mailed to any address on the receipt of fifty cents. The firm has added to its manufacturing facilities, and is prepared to make all kinds of scientific apparatus. Their facilities for making platinum ware are especially to be noted.

—The autumn meeting of the American Oriental Society in Philadelphia, Wednesday, Oct. 31, was the first to be held in that city, the society accepting at its May session the invitations extended on behalf of the University of Pennsylvania and the Oriental Club of Philadelphia. On Wednesday, at 3 o'clock P.M., the society met in the chapel of the University of Pennsylvania; and on Thursday morning and afternoon, in the hall of the Historical Society. The following is a list of the papers read: 'Report on the Exhibit of Oriental Antiquities of the Cincinnati Exposition,' by Cyrus Adler; 'On a New Testament Manuscript, Peshito Version, dated A.D. 1206, with a Text of the Traditions of the Apostles,' by Isaac H. Hall; 'A New Vedic Text on Omens and Portents,' by J. T. Hartfield; 'Qualitative Variations, in the Calcutta and Bombay Texts, of the Mahabharata,' and 'On the Later Puranas (in Sanscrit Literature),' by E. W. Hopkins; 'A New Reference in the Avesta to "the Life-Book" Hereafter,' by A. V. W. Jackson; 'On Transposed Stems in the Babylonian Talmud,' by Marcus Jastrow; 'On a Fragment of the Grammatical Works of Abu Zakariyah Hajjug,' and 'On Symbols of the Sun-God and the Word *Kuduru*,' by Morris Jastrow, jun.; 'On a Samaritan Hebrew Manuscript in the Library of Andover Seminary,' by George F. Moore; 'On Rome Assyrian and Babylonian Royal Prayers,' and 'The Pantheon of Assur-banipal,' by D. G. Lyon; 'Remarks on

the Arabic Dialect of Cairo,' by C. H. Toy; 'The Babylonian Caduceus,' and 'A Babylonian Cylinder from Urumia,' by William Hayes Ward; 'Note on the Arch of Chosroes,' by Talcott Williams. Reports were read on 'The Collection of Oriental Antiquities recently deposited in Washington,' by one of the curators of the National Museum; and on 'The Recent Purchase of Cuneiform Tablets for the University of Pennsylvania,' by a member of the Chaldean Exploration Party.

—The Colorado Ornithological Association has been re-organized under the title of 'Colorado Biological Association.' Its objects are the detailed investigation and recording of the fauna and flora of Colorado, recent and fossil. Annual reports and special bulletins will be issued. The former are to contain a full bibliography of the published records for the State during the year. Mr. T. D. A. Cockerell of West Cliff, Custer County, is secretary of the association.

—Benjamin B. Chamberlin, who has recently died, was born at Keeseville, Me., March 13, 1831. He was the son of the Rev. Parmelee Chamberlin, a Methodist clergyman, formerly well known in New York. After leaving school, he was apprenticed to Benjamin J. Lossing, then an engraver in New York, and subsequently went to Cincinnati to embark in business for himself. About 1865 he returned to New York. While in Cincinnati he turned his attention to collecting, his first hobby being medallions; and after his return to New York he took up the study of minerals, making a specialty of collecting those of New York and vicinity. For this work he had exceptional facilities, as the Fourth Avenue improvement was then in progress, and blasting was going on in many parts of the city now built over. He leaves one collection at the Nyack Library. His foreign collection he sold recently to Mr. Edward Pearson for the new school at Clouldland, N.J. He had been ailing for some years, but his death, which occurred at the home of his brother-in-law, Mr. E. H. Cole, at Nyack, on Oct. 13, was very sudden. At noon he had a severe hemorrhage, and at half-past two passed away, almost without a struggle. The cause of his death is believed to have been rheumatism of the heart. He was buried at Nyack Cemetery, Oct. 16.

—Mr. John Gilmer Speed has become the editor of *The American Magazine*. Mr. Speed was for several years managing editor of the *New York World*, before it was purchased by its present proprietor. Since then he has spent much time in foreign travel, and has also been a frequent contributor to the magazines and newspaper press. He has written a life of John Keats, and edited his letters and poems. In conducting the magazine, it is Mr. Speed's purpose to make it all that its name implies,—an illustrated monthly, representative of American thought and life. —E. and F. N. Spon announce as in preparation, 'A Treatise on Masonry Construction,' by Ira O. Baker; 'Metallic Alloys,' by W. T. Brannt; 'Notes in Thermo-dynamics and Steam-Engine Experiments,' by Prof. C. H. Peabody; and 'A Practical Treatise on Modern Printing Machinery,' by F. J. F. Wilson and D. Grey. —A. & C. Black, Edinburgh, will publish this month the twenty-fourth and concluding volume of the 'Encyclopædia Britannica,' which has been under way nearly ten years. A general index to this encyclopædia is also in press, and may be looked for some time next year. —Arrangements are being made, it is reported, with the sanction of the German Emperor, for the publication of an English translation of the 'Reminiscences of Ludwig Schneider,' who was for twenty-six years the reader, secretary, and confidential friend of the Emperor William. Schneider's diaries were regularly revised by the Emperor every year, and his book is a work of great interest and importance. He accompanied the Emperor throughout the campaigns of 1866 and 1870-71, and one of the most interesting passages is his Majesty's own account of the battle of Rézonville. —Much of the genuine value of the *Atlantic* lies in the terse, clean-cut, and vigorous articles on American history by John Fiske, the latest of which is entitled 'The Eve of Independence.' Mr. Fiske's historical articles are worthy of the highest praise. Lillie B. Chace Wyman continues her 'Studies of Factory-Life,' Miss Murfree, her serial story entitled 'The Despot of Broomsedge Cove,' and William Howe Downes, his papers on 'Boston Painters and Paintings.' William Roscoe Thayer con-

tributes an article on 'The Makers of New Italy,' and John Trowbridge writes on 'Economy in College-Work.' — The issue of *The Youth's Companion* for November contains the article, written expressly for that periodical by Mr. Gladstone, on 'The Future of the English-Speaking Races.' — *Outing* for November contains, besides other notable features, the commencement of a series of articles on the 'Outdoor Life of the Presidents,' from the pen of John P. Foley; and the 'Progress of Athletics,' by Charles Turner. — The November *Century* begins the thirty-seventh volume and nineteenth year of the magazine; and the number is made notable by the beginning of several new series, or magazine 'features.' The most important of these is the first instalment of *The Century* 'Gallery of Old Masters,' engraved by T. Cole, and described by W. J. Stillman and by Mr. Cole himself. The engravings in this series were made in the presence of the original pictures themselves. They are actual copies, and unique in the history of art; for such careful copies have never before been made on wood. Another series begun in November is Mr. Cable's 'Strange True Stories of Louisiana.' After a preface by Mr. Cable himself, comes the extraordinary story of 'The Young Aunt with White Hair,' from an old French manuscript. Among the leading contributions to this number are instalments of the 'Life of Lincoln' and of George Kennan's papers on the Siberian exile system. The guilds of the city of London are described by Norman Moore. Other contributions include 'Bird Music: The Loon,' by Simeon Pease Cheney; 'Mammy's Li'l Boy,' a negro dialect crooning song, by H. S. Edwards, illustrated by E. W. Kemble; 'Memoranda on the Civil War,' Open Letters by George Kennan, Rev. T. T. Munger, Richard Hoffman, and others; etc.

— Dr. John C. Branner, in the first volume of the Proceedings of the Lackawanna Institute of History and Science, gives an interesting sketch of the effects of glaciation in the Lackawanna-Wyoming region, his principal object being to attract special attention to a detailed study of these phenomena. He also publishes a list of localities at which glacial striæ have been observed in that region, for the guidance of those who may take up the work where he was obliged to leave it on being appointed director of the Geological Survey of Arkansas.

— The Boylston medical prize of four hundred and fifty dollars has been awarded by Harvard University to Dr. George H. F. Nuttall of San Francisco, for a dissertation entitled 'A Contribution to the Study of Immunity.'

— The *Journal of Economics* for October opens with a paper by James Bonar on the Austrian economists. Their principal work has been on the theory of value, which they profess to present in an entirely new light; but Mr. Bonar shows that their view, though expressed in new terms, is not so different from that of the English writers as they seem to suppose. Their discussion of 'subjective value' is in his opinion their principal contribution to economics. Another theoretical article is that by Stuart Wood on 'A New View of the Theory of Wages.' The author starts with the fact that in some employments a certain work can be done either by labor or by capital; and from this he deduces the law that in such cases the price paid for a given amount of labor will be equal to the interest on the capital that can be substituted for it. Then the rates of interest and wages thus established will also prevail in all other employments. According to this theory, wages depend on interest; but what interest itself depends on, the author neglects to say. Professor Dunbar's paper on Alexander Hamilton shows that in his sinking-fund scheme, and in establishing the Bank of the United States, Hamilton followed English precedents, though with some variations; but that his plan for establishing the national credit on a firm basis was so comprehensive and so successful as to entitle him to rank as a great financial statesman. The article on 'The Australian Tariff Experiment' is a comparative exhibit of the effects of free trade in New South Wales and of protection in Victoria. The general outcome is to show that manufactures have prospered as well in the free trade colony as in the protected one, while in commerce and in growth of population the former has taken the lead. Wages are essentially the same in both; so that in this case, at least, protection has not raised wages. The acts given in this paper have been published in different forms

elsewhere; but, in the present state of our own tariff question, this new presentation of them will attract attention, and doubtless be useful.

LETTERS TO THE EDITOR.

*.*Correspondents are requested to be as brief as possible. The writer's name is in all cases required as proof of good faith.

Twenty copies of the number containing his communication will be furnished free to any correspondent on request.

The editor will be glad to publish any queries consonant with the character of the journal.

Dream Excitation.

THE direct influence of slight sense-stimuli upon the flow and make-up of our dream consciousness is a well-known fact, which can be proved by artificial experiment (see MAURY, *Le Sommeil et les Rêves*, p. 132, etc.), but which it is difficult to confirm under ordinary circumstances, since we seldom waken after a well-marked dream experience in time to catch the stimulus, or without altering the stimulus by movement, etc. On the night of Oct. 22 I had a dream which perfectly fulfilled the conditions of this experiment. I fell asleep about eleven o'clock, and found myself with a companion in a wood, watching a number of wood-cutters at work. After looking at them for some time, one of the workmen drew my attention quite suddenly by giving forth a strange sound, half musical and half speech, by which he seemed to be trying to express something to his neighbor; and the sound came with every blow of his axe in regular rhythm. The sound seemed to me distinctly familiar and yet very strange, and I turned to my friend and said, "What an apology for conversation!" Just as I spoke, I awoke, and the sound of the peculiar tone of a clock down stairs striking twelve broke in upon my consciousness. The four remaining strokes of the clock preserved exactly the rhythm of the wood-chopper's axe; and not only so, but the sense of familiarity which had puzzled me in the dream was relieved with a glow of pleasure as I recognized the sound of the clock.

This experience illustrates also the remarkable swiftness with which new sensations are assimilated to the character of a previous dream consciousness. Before the clock began, the men were simply cutting, without order or distinction. But when the sound broke in, it was at once *accommodated* to the scene by important modifications. One workman is singled out: he begins to ply his axe in the regular time of the clock-beats, and to give forth a sound which preserves in its general character the peculiarities of the real sound. Now, since I experienced in the dream no less than four beats, as the rhythm was perfectly established and clear in my consciousness, and there remained four beats after I awoke, this whole accommodation must have taken place in the interval between the first and the fifth beat (for it was then twelve o'clock). I have since measured the interval between the strokes of the clock, and find it to be two seconds. The whole time from the first to the fifth beat was therefore eight seconds. From this should be taken the time occupied by the dozed state between dreaming and waking, — say, at least one interval of from two to four seconds. There remains a period of four to six seconds as the time of accommodation. This may be called, in a very rough way, the reaction time for a complex case of constructive imagination; for the constructive imagination is nothing more than the free play of images in forms of ideal composition, due to the influx of additions from the sensorium. There is no direct way of measuring this time in the waking state, since the attention interferes with the process.

MARK BALDWIN.

Lake Forest, Ill., Oct. 23.

Chemical Action between Solids.

APROPOS of Messrs. Spring and Hallock's controversy (*Science*, xii. p. 184), I think that the re-actions between silica and the metallic oxides at temperatures far below the melting-point, not only of both components but even of the silicate itself, have generally been regarded as occurring directly between solids. When certain mixtures of lime and silica are strongly heated, though there be not the slightest indication of fusion, yet some chemical action seems to occur, for the silica now separates in the gelatinous state when acted on by hydrochloric acid (PERCY, *Fuel*, p. 46, 1875).

HENRY M. HOWE.

Boston, Oct. 28.